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The Coastal Plainer

3381 Skyway Drive, P.O. Box 311, Auburn, AL 36830
Phone: (334) 887-4549 Fax: (334) 887-4551
Http://www.mo15.nrcs.usda.gov/

Message from the MO–Leader's Desk

By Charles Love, MO–15 Team Leader

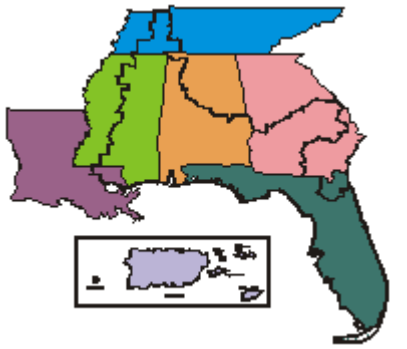
Again, greetings everyone!

We have been very busy the last few months developing a plan to implement MLRA soil survey area offices in the MO–15 region. I would like to share with you the good progress we have made in our planning efforts.

At the MO leader's meeting this summer in Bismarck, North Dakota, all 18 MO leaders presented drafts for the geographic boundaries of the MLRA soil survey areas in their regions. The boundaries were based on criteria established by National Head Quarters (NHQs). After attending the meeting and gathering input from the State Soil Scientists in the MO–15 region, I revised our draft. I expanded some of the areas to better meet NHQ's criteria concerning acreage requirements per geographic area.

The MO–15 State Soil Scientists and I are currently proposing nine geographically based MLRA soil survey areas within the MO–15 region. We have proposed locations for the

MLRA Soil Survey
Region #15



MLRA soil survey offices and satellite offices. We will release the geographic boundaries of the areas and the locations of the proposed offices after the MO–15 Board of Directors approves each location. Approved locations will be submitted for inclusion as a part of the National Soil Survey Area Office Map. Later this year, the MO–15 State Soil Scientists, soil data quality specialists, and I will develop a regional soil survey area office work plan. The work plan will also be presented to the MO–15 Board of Directors for approval.

Thanks go to the MO–15 State Soil Scientists and soil data quality specialists for providing outstanding expertise in our planning efforts. ■

Gary Kobylski New Chair of MO–15 Board and State Conservationist in Alabama

By Julie A. Best, Public Affairs Specialist, NRCS, Auburn, AL

Gary Kobylski, a dedicated conservationist for over 27 years, returns to Alabama as State Conservationist and Chair of the MO–15 Board of Directors. Gary and his wife Rhonda, both graduates of

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Auburn University, are glad to be back in Alabama and to call it home once again.

Gary Kobylski, State Conservationist for Alabama and Chair of MO–15 Board of Directors.

Gary has served at all levels within the Natural Resources Conservation Service (NRCS), including the field, state, regional, and national headquarters. He returns to us from Washington, DC, where he served as the National Environmental Quality Incentives (EQIP) Program Manager and a Resource Conservationist on the Operations Management and Oversight Division. He also provided program and operations management assistance to eight states in the Midwest Region for 9 years.

Gary shared a conservation quote by Aldo Leopold, "When land does well for its owner, and the owner does well by his land; when both end up better by reason of their partnership, we have conservation." Gary then added, "It is my goal to continue fostering a partnership between our landowners and our many conservation partners to ensure generations to come will enjoy the bounty and beauty of the land in Alabama."

Gary has been with us for several months now. We enjoy his fun-loving approach to management. "We've got to have fun while we work hard," is his philosophy. So far, we have all worked very hard! And, we are having a good time along the journey. We welcome Gary, and we're grateful for his leadership. ■

IfSAR: Detailed Elevation Mapping

By Rick Zellmer, GIS Specialist

3-D glasses are not required (although they could add a unique dimension to onscreen soils digitizing). Advances in technology and wider availability of remotely sensed imagery are making elevation data an essential dataset for soil survey project offices. The old 30-meter digital elevation models (DEM) have been heavily utilized in GIS and are still valuable in many types of GIS analyses; however, they are not detailed enough for use in determining slope phases, topographic position, or placement of soil lines.

Interferometric Synthetic Aperture Radar (IfSAR) can create elevation models with vertical accuracies as fine as 30 centimeters (11.8 inches). With IfSAR, radar pulses are aimed at the earth from a plane, and the returned ground signals are received by two antennas that record elevation (z) at specific ground coordinates (x, y). Post processing of the data produces topographic information in the form of orthorectified radar imagery (ORRI). IfSAR can be used to create digital elevation models at 5 meter and 10 meter resolutions, which provide the necessary detail for use with 3d-Mapper. (3d-Mapper is software used for landscape visualization and three-dimensional mapping.) IfSAR collects data over large areas quickly. It penetrates cloud cover, allowing data to be collected day and night under most conditions. In addition to DEMs and ORRI, some of the

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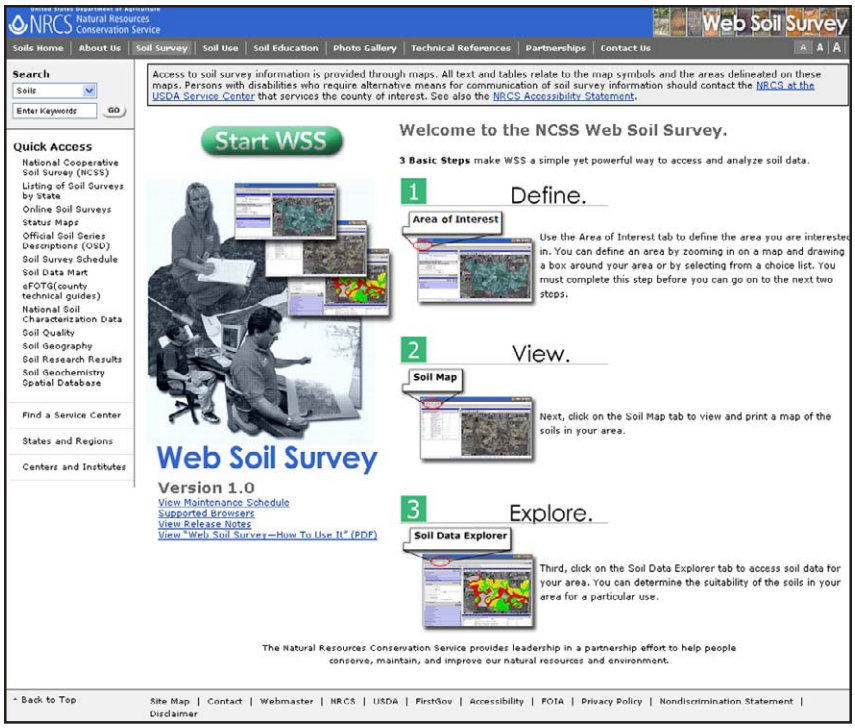

The Web Soil Suvey at http://websoilsurvey.nrcs.usda.gov/app/.

Web Soil Survey

By Aaron Achen, Editor, MO–15

The "Web Soil Survey" allows you to view official soil information for more than 90 percent of the private land in the United States. The site is at http://websoilsurvey.nrcs.usda.gov/app/.

The first step for using the Web Soil Survey is to locate the area in which you are interested. You can select an area in the continental United States, Alaska, Hawaii, the Pacific Basin, Puerto Rico, or the U.S. Virgin Islands. You select an area by zooming in on a locator map or by specifying street address, county, or survey area.

The next step is to view a map of the soils in the area you selected. Soil maps are not yet available for all areas. The maps that are available consist of aerial photography overlain by lines that indicate the boundaries of the various types of soil. A list of the soils is included for each area, and the map can be saved and printed.

The third step is to explore the information associated with the soils. The Web Soil Survey can display the properties and qualities of the soils. It can also show interpretations about the suitabilities and limitations of the soils for many uses. Examples of properties and qualities include available water capacity and pH. Examples of suitabilities and limitations include interpretations about how productive the soils are for various crops and about how well the soils would function as a site for buildings. The information can be displayed in tables and, in many cases, on maps.

Complete, composite publications and full-sized maps are also available for a limited number of survey areas.

The Web Soil Survey is replacing the familiar, traditional paper copies of soil survey reports. As new and updated soil surveys are completed, NRCS is distributing the results of these surveys by means of the Web Soil Survey instead of as books. The Web Soil Survey allows NRCS to update the information more rapidly and ensures a single source for official data. People without computer access can acquire soil survey information from an NRCS field office or local library. ■

"I am leaving this legacy to all of you...to bring peace, justice, equality, love, and a fulfillment of what our lives should be. Without vision, the people will perish, and without courage and inspiration, dreams will die—the dream of freedom and peace"

Rosa Louise Parks, Mother of the Modern Civil Rights Movement

USDA–NRCS Soil Water-Level Data Loggers

By Monday O. Mbila, Alabama A&M University, and Douglas Clendenon, USDA–NRCS

Introduction

Over 94,000 acres of soils in the Redlands of northern Alabama and south-central Tennessee consist of young alluvium in gentle depressions and low-order drainageways. A considerable number of these soils commonly experience saturation in some part of the profile above 1 meter. Iron depletions are not sufficiently expressed to reflect the dynamic depth and duration of the water table. Water-table data loggers are being used to better understand the soil morphology and to aid in soil classification. This research is part of a larger water table study conducted to update soil information within specific geographic areas. The research is conducted by the Natural Resources Conservation Service, cooperating universities, such as Alabama A&M (AAMU), and other partners.

Objectives

- To use water-table logger data to aid in differentiating between Oxyaquic and other taxonomic subgroups.
- To try to explain the gap between the not-so-pronounced redoximorphic features in the soils and dynamic water levels in the soils.
- To try to identify regional soil water table indicators other than iron depletions.

Methods

- Overall, about 85 pedons representing 30 soil series were instrumented between fall 2003 and spring 2004 in 5 states (AL, MS, GA, FL, TN) and the Caribbean area.
- In North Alabama, water-table loggers were installed in piezometers in three replications in two different soil map units. The data from only one map unit is discussed here.
- At each location, the soil was described and piezometers equipped with data loggers were installed to measure ground water table levels every 6 hours.
- Data was downloaded from the piezometers using a palm pilot device.
- Soil core samples to the water table were collected for further analyses.

Results/Discussion

- During 2004 at the AAMU Experiment Station site, piezometers showed the soil water table rise above 1 meter during parts of late fall, winter, and early spring.
- The soil had 45 cumulative days within a period of 1 year in which the soil water table was within 100 cm of the mineral soil surface. The classification of the soil is being proposed as fine-silty, siliceous, thermic, Oxyaquic Dystrudept. In a normal year, the subgroup must have either or both of 20 or more consecutive days or 30 or more cumulative days that soil is saturated within 100 cm of the mineral soil surface.
- At the Fowler Road site, both piezometers remained dry except for about 1 week during late fall when the soil water table rose to 140 cm. The morphology and water-logger data support classification as Fluventic Dystrudepts.
- The soil water table level at the Redstone Arsenal Rideout Road site rose to above 100 cm of the mineral soils surface at least 70 consecutive days and over 150 cumulative days, supporting classification as Oxyaquic Dystrudept.

Conclusions

- Soils are saturated in horizons well above those with chroma 2 or 3 Fe depletions.
- Soft Mn coatings on ped faces, Fe-Mn concretions with soft rinds, and Fe-Mn nodules occur within horizons of saturation.
- Short duration and soil saturation during times of cooler soil temperatures and lower microbe activity possibly influence lack of Fe-depletion formation in the upper part of pedons.
- Within the three different map areas of the same map unit, data supports classification as Oxyaquic Dystrudepts at two sites and

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Things–Other Than Dirt!

By George Martin, Soil Data Quality Specialist, MO–15

Aaron Achen, friend and highly esteemed editor of the "Coastal Plainer," finally caught up with me and convinced me, after much arm twisting, that it was my turn to produce something enlightening (well, maybe not enlightening, but something) for this issue. Aaron made it easier by saying "You don't have to write about soils or soil survey. Just write about something you know a little about or have an interest in." Hmmm, I thought. What did he just insinuate? Well, anyway, Aaron had seen a few pictures of some fossils I had collected and prepped and suggested that I share them. So, I will.

Like most soil scientists, I've always had an interest in the fields of geology and paleontology as they relate to soil formation, soil genesis, and soil survey. My professional interest has evolved into an enjoyable hobby that I spend many hours on. Collecting fossils can be as addictive as hunting, fishing, golfing, etc. and can be done throughout the year. I'm not real particular about what I collect, and my collection includes teeth of many species of sharks, rays, barracuda, other fishes, and crocodiles; sawfish rostrals; shark and ray coprolites; whale vertebrae; shark, fish, and sea snake vertebrae; trilobites; ammonites; ferns; and many species of mollusks. I'll collect just about anything that I can pick up.

Fossil crabs from the Ripley Formation in central Alabama. The small brownish crab is Dacoticancer australis *Rathbun. The rest are "Muffin crabs,"* Avitelmessus grapsoideus *Rathbun.*

"Muffin crabs," Avitelmessus grapsoideus *Rathbun, exposed on the matrix rock.*

Some of my most impressive finds include the crab and turtle fossils shown in the accompanying photos. Both the crabs and turtle were collected in central Alabama from the Ripley Formation, Cretaceous Period, Maastrichtian Age. I've tentatively identified one of the crabs as *Dakoticancer australis* Rathbun and the rest as *Avitelmessus grapsoideus* Rathbun, or "Muffin Crabs." The crabs have been documented from the Ripley Formation in Alabama, Mississippi, and Tennessee. I am currently collaborating with a paleontologist, Dr. Ed Hooks, on the identification of the large marine turtle. He has tentatively placed it in the genus *Ctenochelys,* and both

Periferal bones and plastron of marine turtle, Ctenochelys, *found in the Ripley Formation in central Alabama.*

Pelvic girdle of marine turtle, Ctenochelys, *found in the Ripley Formation in central Alabama.*

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Miscellaneous fossils from a roadcut through the Bashi Marl Member of the Hatchetigbee Formation in southwest Alabama (shark teeth, shark and ray coprolites, ray dental plates, fish vertebrae, bones, and teeth).

Miscellaneous fossils from the Tallahatta Formation in south Alabama (sawfish rostrals, shark vertebrae, sea snake vertebrae, ray stingers, crocodile teeth, fish rostrals, ray dental plates, and shark teeth).

of us are working on a literature review for a proposed journal article or note. Thus far, it is the latest known occurrence of this genus, making it an important enough find that I donated it to the Alabama Museum of Natural History at the University of Alabama.

The crabs and turtle aren't everyday finds, but they certainly keep me anticipating what lies around the next bend of the creek.

My fossil collecting hobby is not only enjoyable but has helped to open up new lines of communication with geologists and paleontologists of the Alabama Geological Survey and others. I always encourage field soil scientists to develop a greater interest in the local geology. Not only will they learn something, but they might even share a new collecting site with me. It never hurts to keep the old correlator happy. Hope you enjoy the photos. ■

GIS in Alabama Soil Survey

By Zamir Libohova, Stephon Thomas, Jerome Langlinais, Charles Love, and George Martin, USDA–NRCS

The NRCS Soil Survey Program in Alabama is rapidly expanding its use of digital products. New digital technologies, including Geographic Information Systems (GIS), Global Positioning Systems (GPS), and Remote Sensing, are being introduced and extensively utilized. Digital technology is being used in initial and update soil surveys and in digital soil survey publications.

In the initial and update soil surveys, ArcMap, ArcView, OrthoMapper, and 3d-Mapper software are used to combine information from topographic maps (USGS 7.5 minute quadrangle), aerial photographs, infrared aerial photographs, geological maps, plat books, and other sources. Various thematic maps are generated through digital transformations and used during field soil mapping. Maps combining topographic lines, aerial photography, and shaded relief from Digital Elevation Models (DEMs) help soil scientists to initially identify slopes (gradients and shapes), elevation, relief, and landscapes used for establishing and delineating map units. In the field, aerial photographs and GPS are used to further adjust map unit delineations based on actual landscape positions.

The adjusted map unit delineations are transferred from the topographic field map to a digital format in two steps. In the first step, the soil lines are transferred from the topographic image to Mylar. In the second step, the soil lines are transferred from Mylar to a digital form. Map unit delineations or existing soil survey maps are scanned to create "TIFF" files, which are orthorectified, or georeferenced, using ArcMap and Orthomapper. Using

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ArcGIS digitizing tools, polygon coverages and shape files are created with attributes for map unit names, acres, and other soil properties. The estimated time for creating a geodatabase, digitizing, and attributing varies from 40 to more than 200 hours per 7.5 USGS quadrangle (1:24,000), depending on the detail of mapping and the GIS knowledge of the user. When a soil scientist conducts or supervises these transfers, quality control is assured because the scientist can view the soil lines in detail. Missing and incorrect symbols are easily spotted and fixed.

The new digital soil maps are used as a basis for producing digital soil surveys in Alabama. The digital soil surveys can be uploaded to the web and made available to internal and external customers through CDs.

Of the 67 Alabama counties, 47 soil surveys areas are currently SSURGO certified, meeting all standards and specifications for a digital product (both tabular and spatial). Tabular data is available for the other 20 counties. The goal is to have spatial and tabular data for all published soil surveys by 2007. These soil surveys are available on the newly launched Web Soil Survey site at: http://websoilsurvey.nrcs.usda.gov/app. ■

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common products derived from IfSAR are topographic line maps, contours, shaded relief maps, and slope and aspect maps.

The Natural Resources Conservation Service is acquiring and evaluating a limited amount of IfSAR data. If IfSAR provides the detailed elevation model needed for soil survey and conservation planning at a reasonable cost, it may become as common as the digital orthophoto quadrangles in project and field offices. For more information on IfSAR, do a Google search; there are more than 36,000 references. ■

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Fluventic Dystrudepts at one site.

• The water-table data loggers are generating data that are useful for populating the NASIS database and are supplying information required for classification of the soils.

Acknowledgments

This work is being done collaboratively by Alabama A&M University and NRCS. The personal contributions of George Martin, Ore‘ Kuinyinu, and Bob Metzl are gratefully acknowledged. We also wish to thank Redstone Arsenal and local landowners for supporting this research. ■

Editor’s Note

Issues of this newsletter are available on the Internet on the MO–15 homepage (http://www.mo15.nrcs.usda.gov/). Click on “News” and then on “The Coastal Plainer.”

You are invited to submit stories for future issues to Aaron Achen, editor, MO–15, Auburn, Alabama. Voice—(402) 437-4157; FAX—(402) 437-5336; e-mail—Aaron.Achen@al.usda.gov.

Hollisha Green and Thomas Mbeli, students at Alabama A&M University, working on a digital compilation project as part of a cooperative effort between the university and NRCS.

Soil Digitizing Projects Near Completion

By Joe Gardinski, NRCS Cartographer

Alabama A&M University's soil compilation and digitization efforts are winding down with the completion of Marion County, Alabama. The cooperative effort between Alabama A&M and NRCS involved the digital compilation of Lauderdale, Colbert, and Marion Counties in Alabama.

This cooperative effort served both NRCS and the university well. Dr. Wubishet Tadesse, GIS Lab Team Leader, directed the digital soil survey project for Alabama A&M. He credits the project with allowing students to acquire valuable GIS skills that will serve them in the workplace. Students acquired skills in georeferencing scanned maps, heads-up digitizing, the use of ArcScan's Vector Trace, the use of the geodatabase in ArcGIS, and the error checks associated with digital soils compilation.

According to Doug Clendenon, North Alabama MLRA Project Leader, "The students have done a great job with this project. They have an excitement to learn, and the quality of work is very high. Hats off to Dr. Tadesse and Joe Gardinski for the direction to make this thing work!"

Marion County is expected to be completed by the end of the year. The University is interested in obtaining additional similar opportunities to extend their efforts in the creation of digital soil surveys.

USDA